U.S. PC WORKSTATIONS USER REQUIREMENTS

1991

INPUT

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U.S. PC/WORKSTATION SYSTEMS USER REQUIREMENTS

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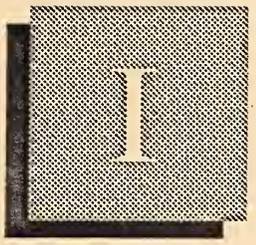

Introduction

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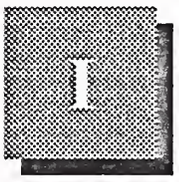

Introduction

This report presents PC/workstation systems user requirements for and satisfaction with the service and support received from service vendors. The report analyzes users' requirements for services ancillary to the actual maintenance of the computer system.

A
Scope

The report examines the service requirements of users of the following PC/workstation systems: Apollo workstations, IBM PS/2, and Sun workstations. Exhibit I-1 provides a breakdown of the manufacturers included in the sample.

EXHIBIT I-1

User Sample by Vendor

Vendor	Completed Interviews
Apollo	35
IBM PS/2	32
Sun	33
Total Sample	100

Each vendor/product analysis includes:

- Service contract coverage, both days per week and hours per day
- Users' criteria for selecting a service vendor

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- Service contract type
- Type of vendor providing service
- Perceptions of independence maintenance organizations, and why they are used or not
- Traditional areas of system availability, response time, repair time and aspects of hardware service
- System software support areas, type of vendor, type of contract
- Aspects of systems software support
- Response/fix time for software problems
- Opportunities for other ancillary services
- Percent of users receiving multivendor service and the expected level of interest in three years in multivendor service and single-point-of-contact service
- Current use of discounts and willingness of users to investigate discounts not currently received

The report is presented in four chapters. Chapter I provides an introduction to the report, the scope, methodology, interpretation of data, and data presentation. Chapter II is an overview of the PC/workstation systems sample. Chapter III provides individual analyses by product vendor. Wherever possible, comparisons will be made to the information presented in the report *U.S. PC/Workstation Systems User Requirements, 1990*, or to the sample as a whole. Chapter IV provides comparative exhibits, examining each area by vendor. Appendix A is the questionnaire used for the research.

B
Methodology

For this report, INPUT surveyed 100 users of personal computers and workstations in the U.S. as to their requirements for and satisfaction with the service they receive. Each interview was conducted by telephone or fax using the questionnaire in Appendix A. INPUT targets the appropriate systems executive with responsibility for coordinating the maintenance of the system. Typical titles include Data Processing Manager, IS Director or Manager, Data Center Manager, or Vice President of IS. The companies interviewed represent a variety of industries, as shown in Exhibit I-2.

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EXHIBIT I-2

User Sample by Industry Sector

Industry	Respondents
Manufacturing	32
Distribution	3
Utilities	2
Banking/Finance	3
Education	25
Services	23
Medical	2
Federal Government	8
State/Local Government	2
Total	100

INPUT emphasizes the value of telephone interviews over other types of research-gathering techniques due to the ability of the interviewer to focus the respondent and control the source of information and the size of the sample. The questionnaire was faxed to many respondents, who wished to see the full questionnaire before responding.

After the data-gathering process was complete, the information was entered into a dBase III Plus (Ashton-Tate) data base and analyzed using ABstat (Anderson Bell). Quality control measures are applied at each step to ensure data integrity.

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C
Interpretation of Data

Mean values are used throughout the tabulated data presented in this report. These means refer to the mean value of user ratings for specific aspects of service performance, or the mean value of a range of service performance factors required or received by the respondents.

In this report, the ratings for service requirements ranged from 1 to 10, with 1 equal to a very low requirement or satisfaction and 10 being an extremely high requirement or satisfaction. In some cases, 0 was used to denote no requirement for service or a service not received at all from the vendor.

For the purposes of this report, the following definitions apply:

- System availability refers to the time the system is actually available for processing, disregarding non-critical peripheral outages or normal preventive maintenance downtime.
- Response time is the time between the placement of a service call to the vendor and the arrival of the service engineer on site.
- Repair time relates to the time the service engineer spends working on the system until it is fully operational.
- Difference is a comparison of the mean service required with the mean service received. A negative number denotes a shortfall in the service received. A positive number denotes that the mean service received exceeded the mean service required.
- Percent satisfied is based on whether the service received met or exceeded service required for each individual respondent. A count is made of the number of individuals who had their requirements met or exceeded for that particular service requirement, which converts to the percent satisfied.

D
Data Presented

For each of the four user sections (PC/Workstation Systems, Apollo, IBM PS/2, and Sun) of this report, the following fifteen exhibits will be presented:

Exhibit 1 - *Contract Coverage* presents the days-per-week and hours-per-day maintenance coverage as reported by the respondents.

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Exhibit 2 - *Service Vendor Selection Criteria* analyzes the importance of certain criteria in selecting a service vendor.

Exhibit 3 - *Hardware Maintenance Provider* presents the reported sources of service used by the sample to provide required maintenance on their hardware. Multiple sources of hardware maintenance service are allowed.

Exhibit 4 - *Reasons IMO Not Used* present the reasons users do not use an IMO as part of their maintenance plan for equipment.

NOTE: When applicable, a special Exhibit 4A *Reasons for IMO Use* is included to describe issues relating to why users have an independent maintenance organization as part of their maintenance plan.

Exhibit 5 - *Maintenance Contract Terms* provides information on the length of contract terms or types of maintenance contracts held by the sample.

Exhibit 6 - *System Availability Performance Analysis* examines the mean system availability, response time and repair time required by the sample; the system availability, response, and repair times received; and the percent of the users having their requirements met or exceeded.

Exhibit 7 - *System Failure Rates* are presented, giving the mean number of failures per year, and the mean percentages for the approximate causes of the failures.

Exhibit 8 - *Hardware Service Required versus Received* examines six individual aspects and overall hardware maintenance service as to the level of service required, the level received, satisfaction with service and the percent of respondents having their requirements met or exceeded.

Exhibit 9 - *Software Maintenance Provider* presents the sources of system software support used by the sample. Multiple sources are recorded where applicable.

Exhibit 10 - *System Software Maintenance Contract Terms* presents the types of service contracts held by the respondents to support system software.

Exhibit 11 - *System Software Problem Resolution* provides information on the resolution of system software problems, on site and over the phone. The exhibit also covers the percent of respondents that had their software support requirements met or exceeded concerning response time and fix time on software problems.

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Exhibit 12 - *System Software Support Required versus Received* examines six aspects of and overall system software support regarding the level of support required by the respondents, the level received, mean satisfaction with system software support and the percent of users having their requirements met or exceeded.

Exhibit 13 - *Ancillary Services* presents information on the current market for other services ancillary to the maintenance function and the possibility for the expansion of these services. Information is presented on the number of respondents currently receiving these services, their mean requirement, mean level received, and the percent of respondents having their requirements met or exceeded.

Exhibit 14 - *Multivendor Services* examines the percent of respondents receiving multivendor services on their CPU, peripherals, and network products. The level of interest in multivendor services in three years and the interest in single-point-of-contact service is also presented.

Exhibit 15 - *Discounts* presents the percent of respondents currently receiving discounts for reduced levels of service or special contractual arrangements and the interest in these discounts by those not receiving them at this time.

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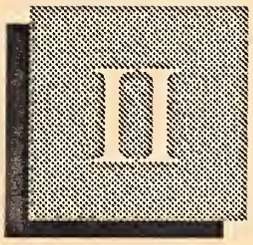
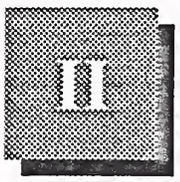


PC/Workstation Systems Summary



PC/Workstation Systems Summary

The overall 1991 PC/workstation sample consists of 100 users of Apollo, IBM PS/2, and Sun personal computers and workstations. Data for the users group as a whole is presented with the following key highlights:

- Service quality issues received higher mean importance ratings than in 1990, with approximately the same relative ranking in importance.
- Major reasons given by the respondents for not using an IMO as part of the service scheme were satisfaction with the manufacturer for service and the belief that the manufacturer has a technological advantage. Major reasons given for using an IMO were lower costs and local service.
- Sixty percent of the respondents reported having a one-year contract with their service vendor.
- Eighty-five percent of the users received software response times equal to or less than their requirement, even though the mean time received was higher than the mean time required.
- There seems to be a fairly healthy market for ancillary services in the PC/workstation group, with approximately half of the users that require service ancillary to the maintenance of their computer systems receiving it.

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EXHIBIT II-1

Contract Coverage
PC/Workstation Systems

	Percent of Sample	
	1991	1990
Days Covered		
Monday - Friday	83	67
Monday - Saturday	3	0
Monday - Sunday	14	33
Hours Covered		
1 - 9	75	58
10 - 16	9	0
17 - 24	16	42

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EXHIBIT II-2

Service Vendor Selection Criteria
PC/Workstation Systems

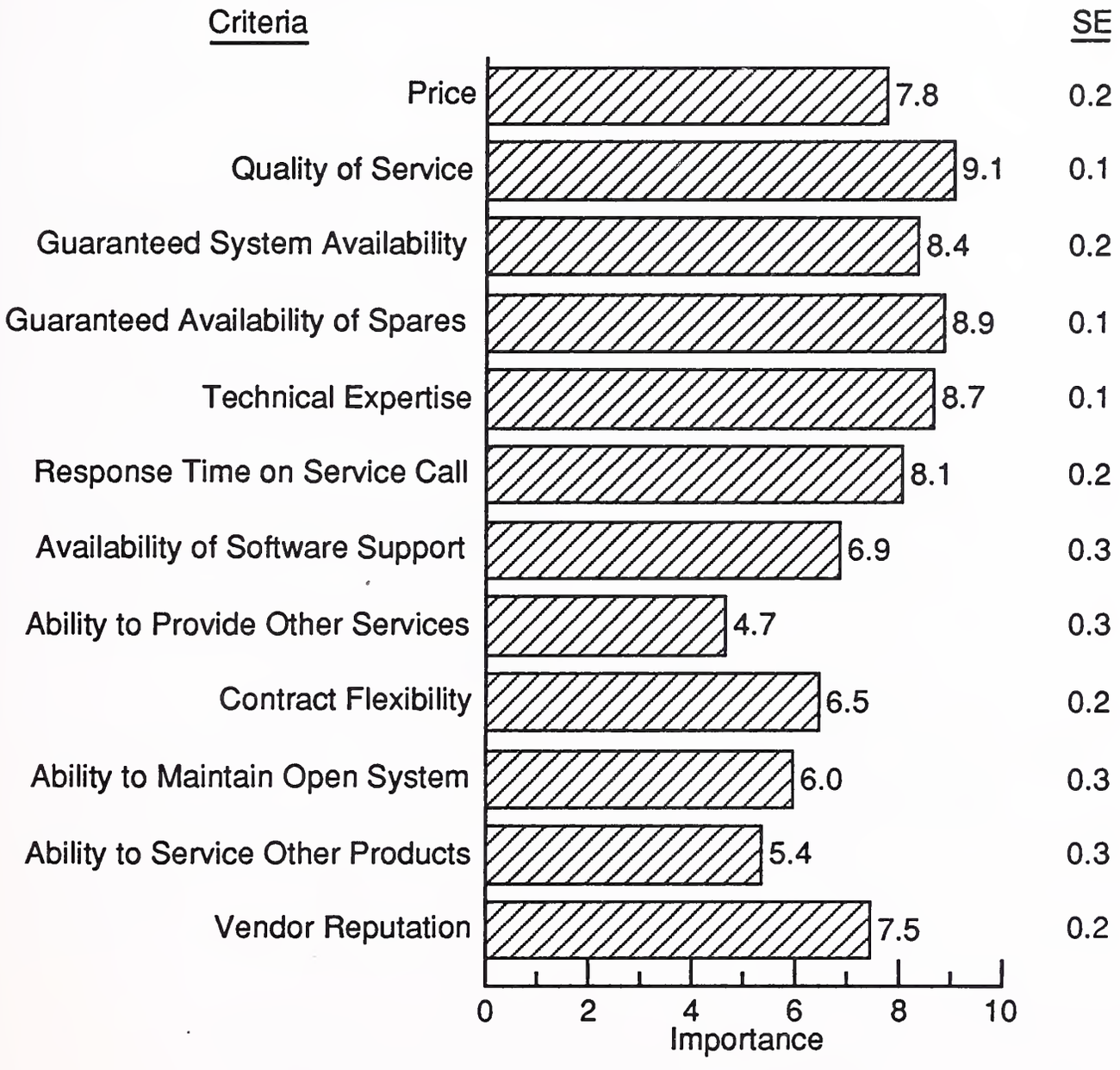

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EXHIBIT II-3

Hardware Maintenance Provider PC/Workstation Systems

Provider	Percent of Mentions	Primary
Manufacturer	60	50
Dealer/Distributor	7	4
Independent Maintenance Organization	44	37
In-House	23	9
Other	1	0

Multiple Responses Allowed.

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EXHIBIT II-4

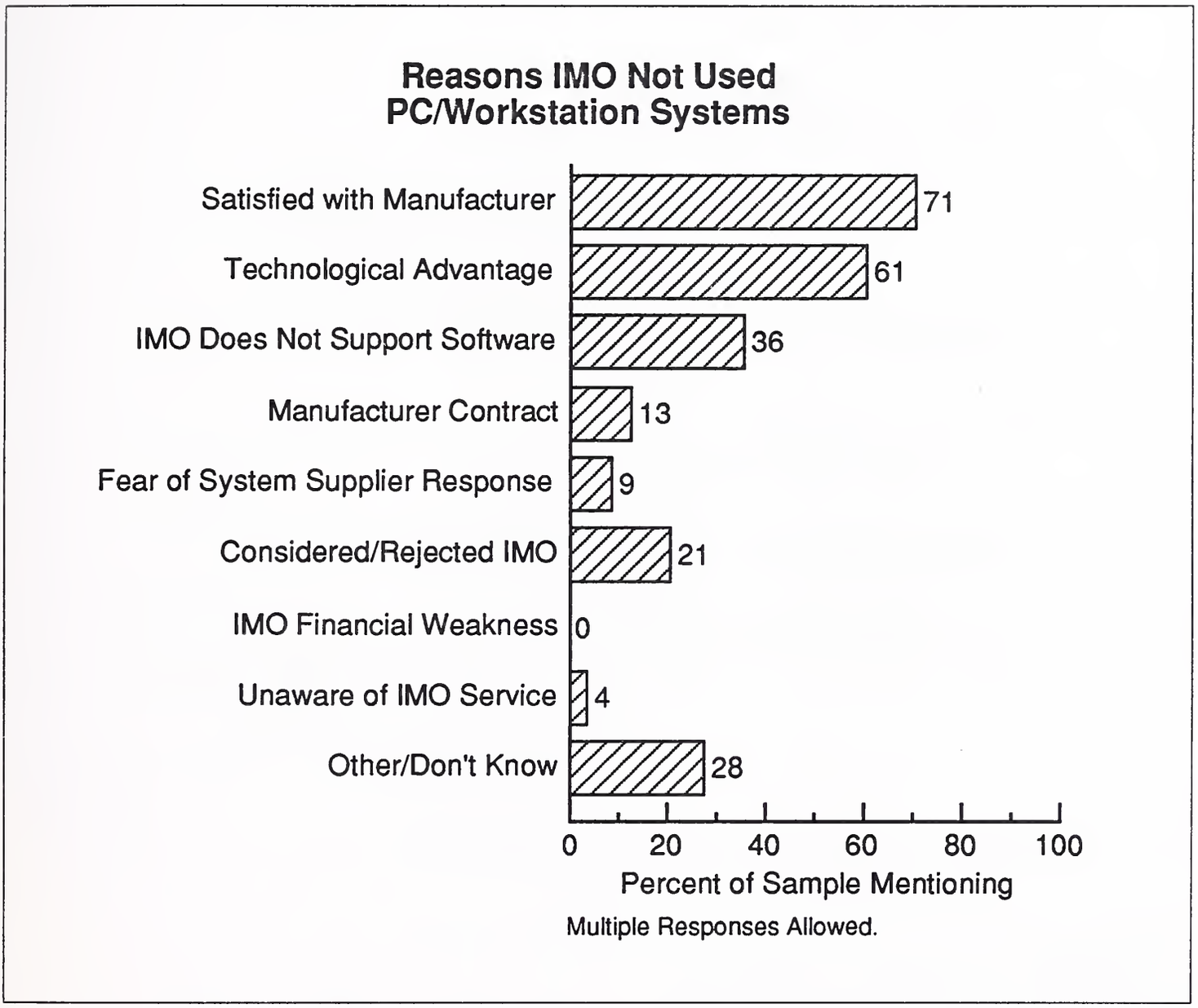

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EXHIBIT II-4A

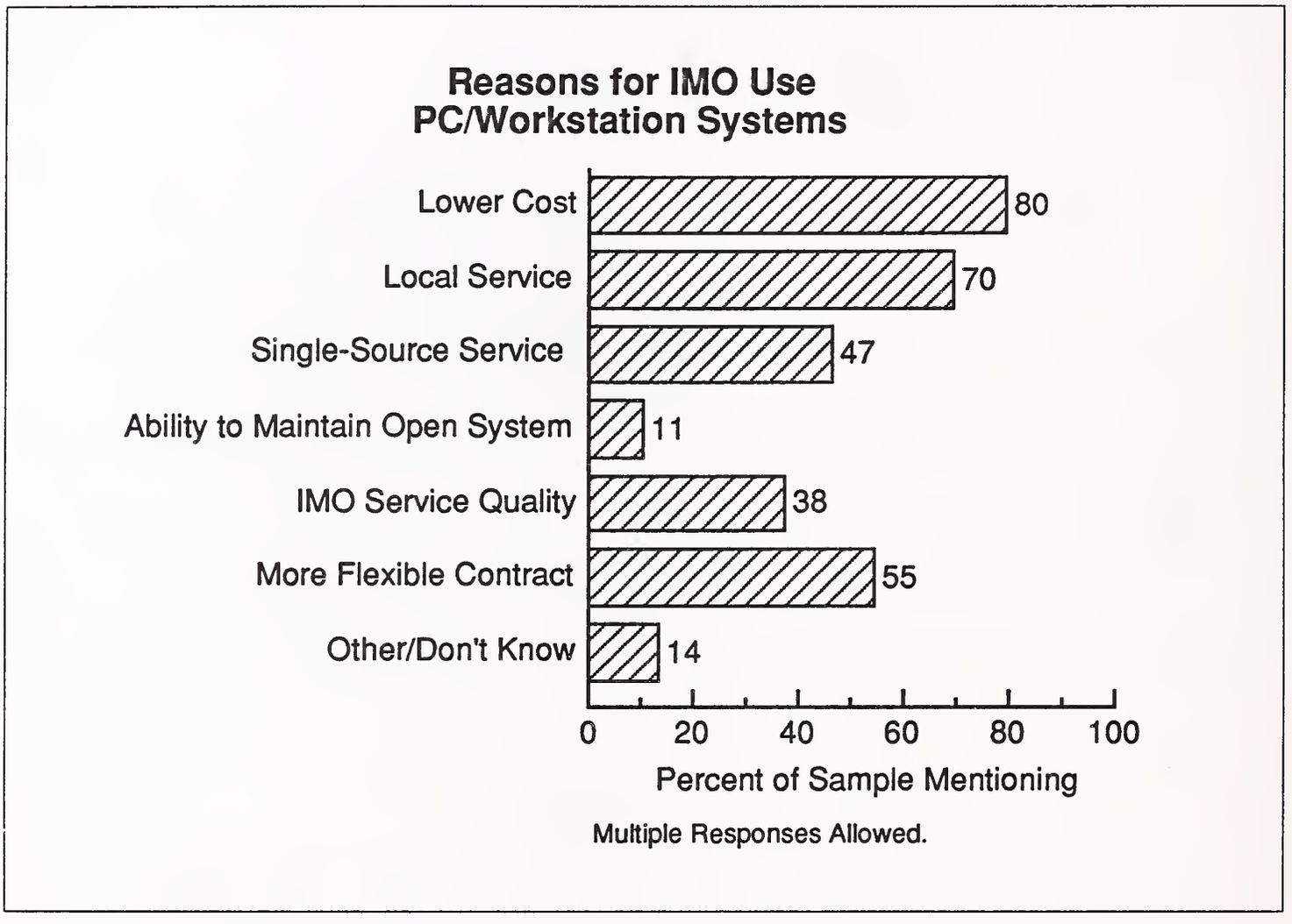

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EXHIBIT II-5

Maintenance Contract Terms PC/Workstation Systems

Hardware Maintenance	Percent of Respondents
Warranty	4
Five Years	1
Three Years	4
One Year	60
Time and Materials	20
Other	5
None	6

EXHIBIT II-6

System Availability Performance Analysis PC/Workstation Systems

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	96.8	96.4	59
Response Time (hrs.)	8.9	8.5	88
Repair Time (hrs.)	12.5	12.5	81

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EXHIBIT II-7

System Failure Rates
PC/Workstation Systems

Mean Failures Per Year	0.6
Causes of Failure (%)	
Hardware	77
Systems Software	10
Applications Software	3
Other	10

Sample: 94

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EXHIBIT II-8

Hardware Service Required versus Received PC/Workstation Systems

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	8.8	8.2	8.5	64
Engineer Skills	8.4	7.7	7.9	68
Documentation of Maintenance	7.1	6.8	7.1	62
Help Desk Support	7.3	7.0	7.3	72
Remote Diagnostics	4.7	5.2	6.5	71
Real-Time Software Diagnostics	5.0	6.0	6.7	73
Overall Hardware Maintenance	8.8	8.1	8.2	61

Note: Scale 1-10, 1 = Lowest, 10 = Highest

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EXHIBIT II-9

Software Maintenance Provider PC/Workstation Systems

Provider	Percent of Mentions
Hardware Manufacturer	55
Other Hardware Service Provider	3
Software Product Vendor	18
Value-Added Reseller (VAR)	5
In-House	59
Other	1

Multiple Responses Allowed.

EXHIBIT II-10

System Software Maintenance Contract Terms PC/Workstation Systems

Software Maintenance	Percent of Respondents
Included in License Fee	14
Three-Year	3
One-Year	39
Custom	12
None	26
Don't Know	6

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EXHIBIT II-11

System Software Problem Resolution PC/Workstation Systems

Solved by Phone (%)	53
Elapsed Time (hrs.)	14.1
Other Problems	
Response Time	
• Required (mean hrs.)	9.9
• Received (mean hrs.)	11.0
• Percent Satisfied	85
Fix Time	
• Required (mean hrs.)	6.3
• Received (mean hrs.)	6.9
• Percent Satisfied	74

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EXHIBIT II-12

System Software Support Required versus Received PC/Workstation Systems

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.7	7.9	7.8	56
Documentation	8.7	7.8	7.9	58
Software Installation	7.9	7.5	7.9	60
Provision of Updates	8.3	7.7	7.8	71
Operational Training	6.5	6.6	7.2	67
Software Remote Support	5.6	6.0	6.8	63
Software Support Overall	8.3	7.6	7.8	59

Note: Scale 1 -10, 1 = Lowest, 10 = Highest

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EXHIBIT II-13

Ancillary Services
PC/Workstation Systems

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	47	6.1	6.9	80	38
Capacity Planning	43	6.0	6.2	62	39
Environmental Planning	35	4.9	5.4	67	37
Cabling	49	6.6	6.5	65	34
Software Evaluation	44	6.1	6.0	59	43
Maintenance-Related Training	37	5.4	5.8	60	37
Install/Deinstall/Move	56	6.5	6.8	68	27
Consulting	52	5.5	6.6	73	22
Network Planning	52	6.9	6.3	56	30
Network Management	45	6.6	6.3	51	36
Disaster Recovery	41	7.0	6.7	55	40
Facilities Management	30	5.2	5.2	57	38
Problem Management	42	6.0	5.8	57	30
Applications Software Support	81	7.0	6.9	50	22

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EXHIBIT II-14

Multivendor Services
PC/Workstation Systems

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	21	2.5
Peripherals	31	2.8
Network Products	22	2.6

	Level of Interest
Single Point of Contact	3.4

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT II-15

Discounts
PC/Workstation Systems

	Percent Receiving	Mean Willingness to Receive
Multiyear	19	4.1
Prepayment	29	3.6
Call Screening/Problem Management	9	3.7
Deferred Response	10	3.4

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest

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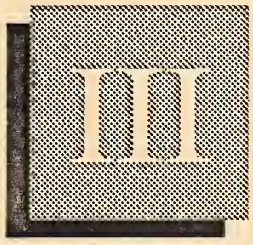
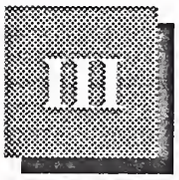


Vendor Performance Data



Vendor Performance Data

Chapter III presents the individual vendor/product analyses for Apollo, IBM PS/2, and Sun PC/workstation systems.

A
Apollo

The Apollo sample consisted of 35 users of workstation systems. In the analysis of the Apollo information, the following points are noteworthy:

- Service issues of quality, technical expertise, spare parts, and response time rated highest in terms of evaluating service vendors. The availability of software support appeared to be important to the Apollo sample, with a mean of 8.1. Price ranked sixth in importance as a criterion used to evaluate service vendors.

- The Apollo sample had a higher percent of respondents mentioning the manufacturer as a service provider than respondents from other PC/workstation groups, with a higher percent of users having the manufacturer as the primary service provider.

- A relatively high percent—73%—of respondents reported satisfaction with the manufacturer as a reason they do not subscribe to any type of independent maintenance service for their Apollo systems. Sixty-seven percent believed that the manufacturer had a technological advantage in servicing the equipment, an attitude seen more in the workstation than in the personal computer area.

- Lower cost, local service, and contract flexibility were the most frequently mentioned reasons why respondents do have independent maintenance organizations as part of their service schemes.

- System availability seems to be just slightly missing the requirements of users, with only 51% of the users receiving the required level of system availability. Response time for the Apollo group was good, with 78% of the users receiving response time at or less than their requirement. Yet

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overall, hardware maintenance appears to be lacking, with only 61% of the respondents receiving adequate levels of maintenance from their vendors.

- The Apollo sample, as opposed to the other two groups, had the highest percent of users receiving software support from the manufacturer and the lowest percent of users receiving software support from their in-house staff.

- The Apollo respondent group had a fairly low percent of users receiving their required level of software support—47%. All of the categories had under 65% of the respondents receiving satisfactory service.

EXHIBIT III-A-1

Contract Coverage
Apollo

	Percent of Sample	
	1991	1990
Days Covered		
Monday - Friday	90	100
Monday - Saturday	3	0
Monday - Sunday	7	0
Hours Covered		
1 - 9	87	87
10 - 16	7	0
17 - 24	6	13

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EXHIBIT III-A-2

Service Vendor Selection Criteria
Apollo

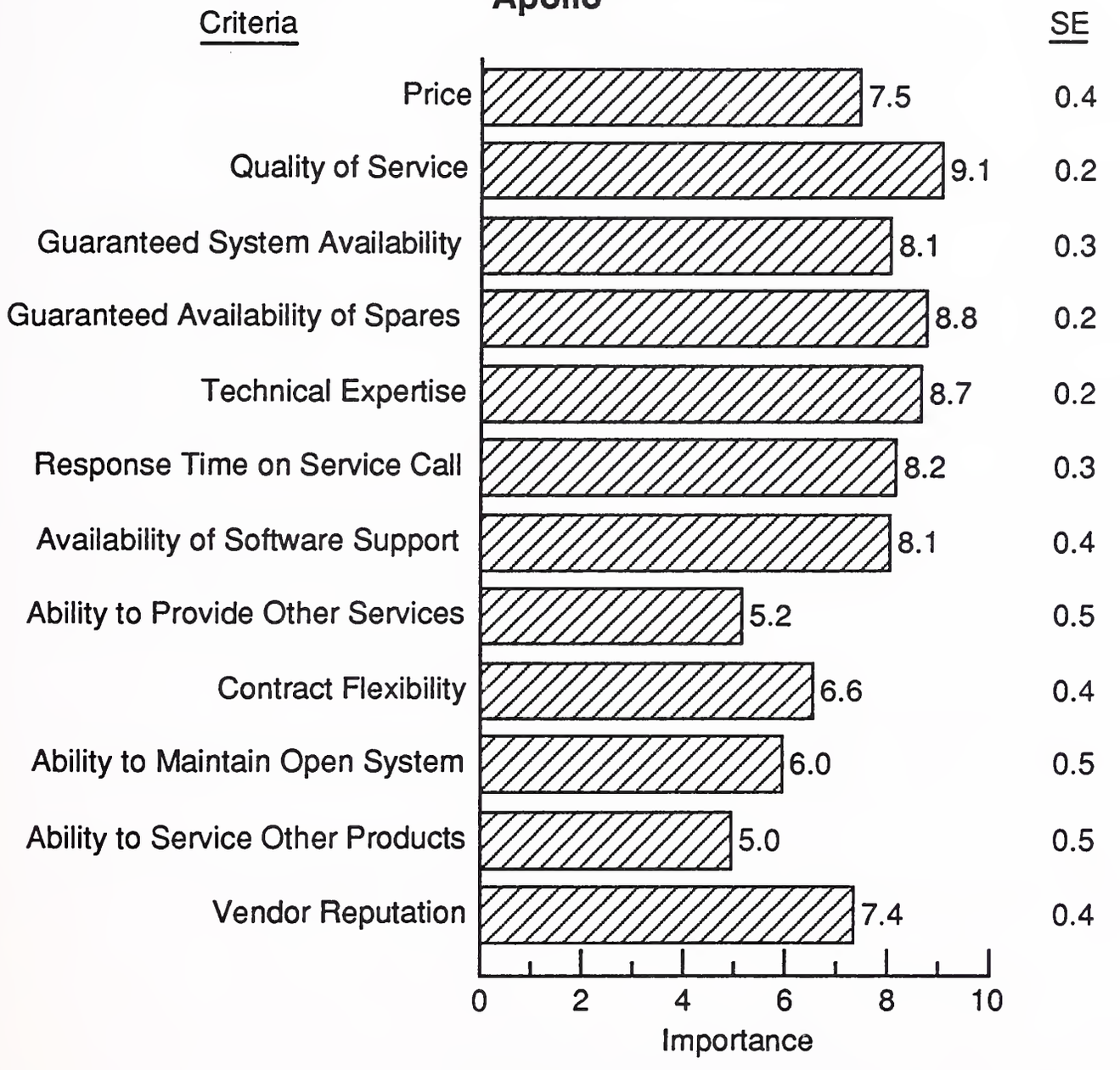

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EXHIBIT III-A-3

Hardware Maintenance Provider
Apollo

Provider	Percent of Mentions	Primary
Manufacturer	74	60
Dealer/Distributor	6	6
Independent Maintenance Organization	37	26
In-House	29	9
Other	3	0

Multiple Responses Allowed.

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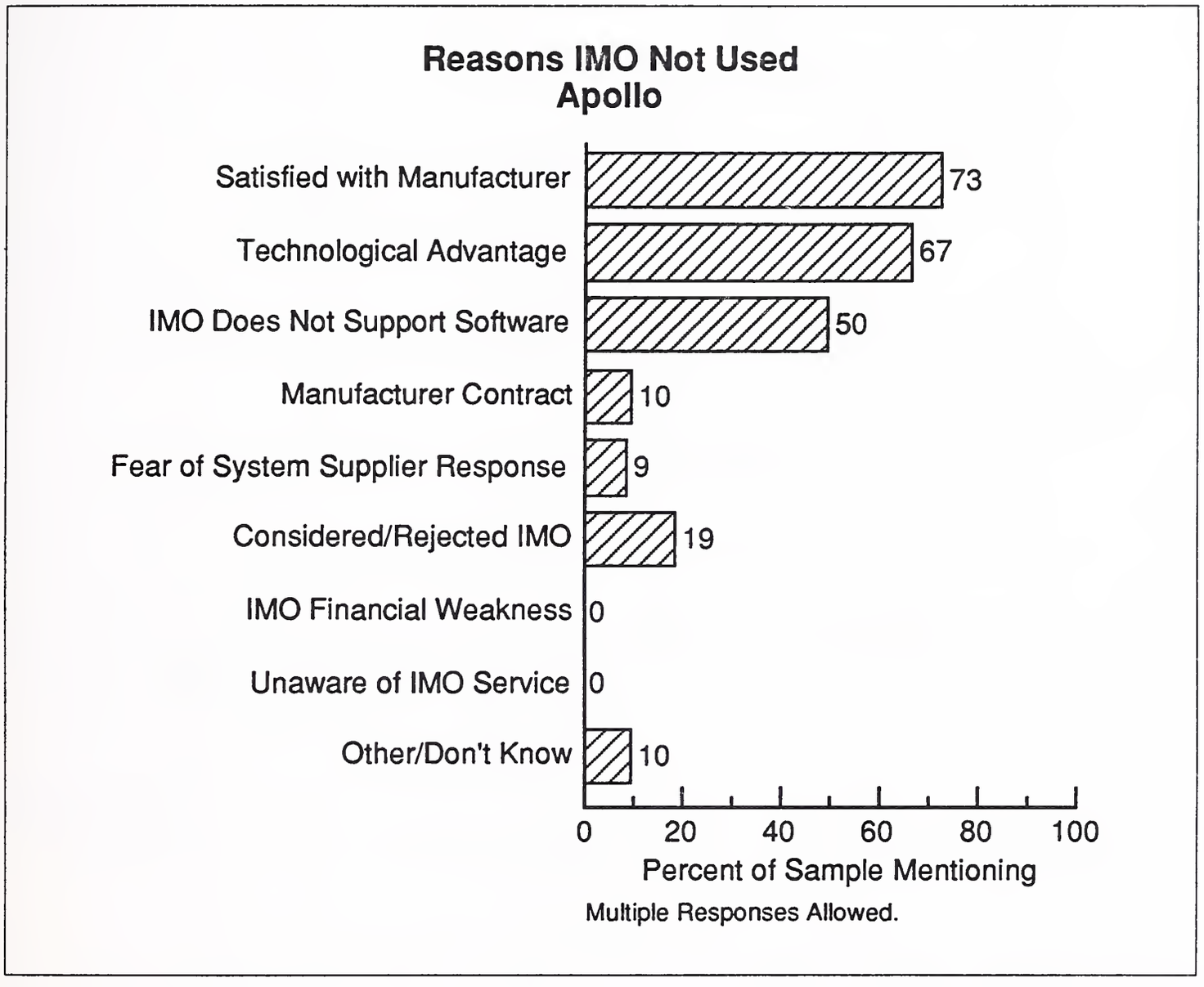
EXHIBIT III-A-4



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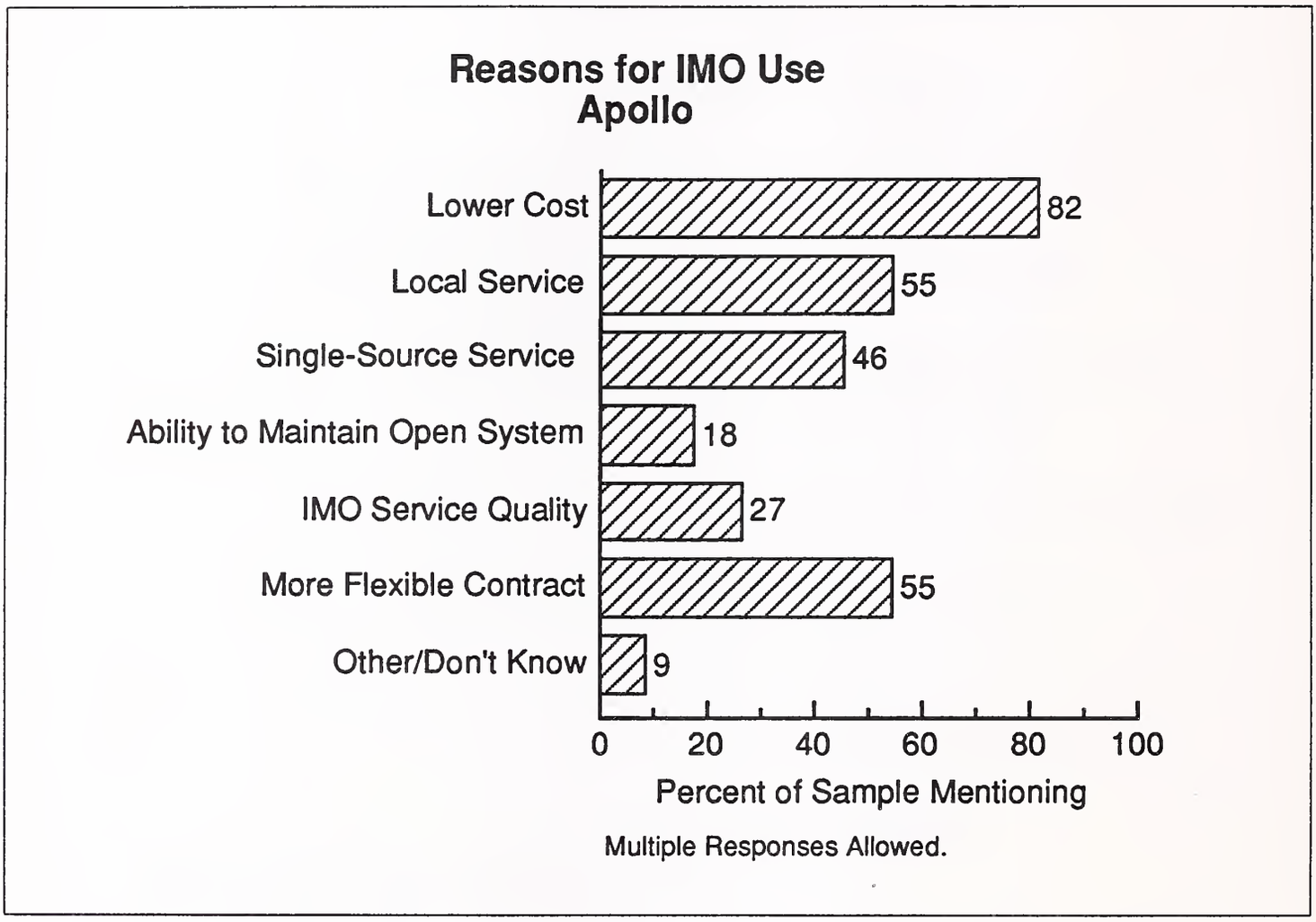

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EXHIBIT III-A-5

Maintenance Contract Terms
Apollo

Hardware Maintenance	Percent of Respondents
Warranty	3
Five Years	0
Three Years	6
One Year	71
Time and Materials	11
Other	0
None	9

EXHIBIT III-A-6

System Availability Performance Analysis
Apollo

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	95.5	95.4	51
Response Time (hrs.)	10.7	10.4	78
Repair Time (hrs.)	8.0	9.8	76

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EXHIBIT III-A-7

System Failure Rates
Apollo

Mean Failures Per Year	1.0
Causes of Failure (%)	
Hardware	81
Systems Software	11
Applications Software	2
Other	6

Sample: 35

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EXHIBIT III-A-8

Hardware Service Required versus Received
Apollo

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	8.4	8.3	8.6	73
Engineer Skills	8.2	7.8	7.9	73
Documentation of Maintenance	7.1	7.1	7.4	59
Help Desk Support	7.3	7.3	7.6	75
Remote Diagnostics	4.5	5.1	6.6	73
Real-Time Software Diagnostics	4.1	5.9	6.8	73
Overall Hardware Maintenance	8.9	8.2	8.2	61

Note: Scale 1-10, 1 = Lowest, 10 = Highest

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EXHIBIT III-A-9

Software Maintenance Provider
Apollo

Provider	Percent of Mentions
Hardware Manufacturer	69
Other Hardware Service Provider	3
Software Product Vendor	23
Value-Added Reseller (VAR)	0
In-House	37
Other	3

Multiple Responses Allowed.

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EXHIBIT III-A-10

System Software Maintenance Contract Terms Apollo

Software Maintenance	Percent of Respondents
Included in License Fee	23
Three-Year	3
One-Year	60
Custom	6
None	6
Don't Know	2

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EXHIBIT III-A-11

System Software Problem Resolution Apollo

Solved by Phone (%)	62
Elapsed Time (hrs.)	17.8
Other Problems	
Response Time	
• Required (mean hrs.)	18.1
• Received (mean hrs.)	19.2
• Percent Satisfied	75
Fix Time	
• Required (mean hrs.)	6.4
• Received (mean hrs.)	6.1
• Percent Satisfied	100

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EXHIBIT III-A-12

System Software Support Required versus Received Apollo

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	9.0	7.7	7.8	47
Documentation	8.8	7.5	7.7	38
Software Installation	8.1	7.0	7.5	47
Provision of Updates	8.2	7.3	7.7	56
Operational Training	6.9	7.2	8.1	64
Software Remote Support	5.8	5.6	6.6	50
Software Support Overall	8.6	7.5	7.8	47

Note: Scale 1-10, 1 = Lowest, 10 = Highest

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EXHIBIT III-A-13

Ancillary Services
Apollo

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	18	6.1	7.1	82	14
Capacity Planning	16	6.0	5.8	40	15
Environmental Planning	16	5.7	5.5	67	14
Cabling	20	6.8	6.5	65	12
Software Evaluation	18	6.1	6.3	56	15
Maintenance-Related Training	16	5.6	6.1	75	14
Install/Deinstall/Move	24	6.6	6.8	58	8
Consulting	18	5.8	7.1	78	8
Network Planning	23	7.4	6.5	61	10
Network Management	20	7.2	6.9	65	13
Disaster Recovery	21	7.7	6.4	50	11
Facilities Management	15	5.8	5.1	40	17
Problem Management	19	6.6	5.8	42	11
Applications Software Support	27	7.3	6.9	44	6

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EXHIBIT III-A-14

Multivendor Services
Apollo

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	20	2.3
Peripherals	29	2.6
Network Products	17	2.4

	Level of Interest
Single Point of Contact	3.6

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-A-15

Discounts
Apollo

	Percent Receiving	Mean Willingness to Receive
Multiyear	14	4.4
Prepayment	17	3.4
Call Screening/Problem Management	4	4.3
Deferred Response	14	3.5

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest

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B
IBM PS/2

The IBM PS/2 sample consisted of 32 users of IBM PS/2 personal computers. The following points appear significant in the information:

- Quality of service and guaranteed availability of spare parts tied for the highest mean rating of importance in selecting a service vendor.
- There does not appear to be any overwhelming reason why the IBM PS/2 users do not use an IMO, as there was in the 1990 study. Although satisfaction with manufacturer was mentioned most often (50%) it was not the high 71% of the 1990 sample. Local service and lower cost were again mentioned as the two major reasons why IMO service was used by the respondents.
- Spares availability received for the sample is lower than the mean level of spares availability required, 8.2 and 9.2 respectively. Only 52% of the sample received spares availability that met or exceeded requirements, yet the mean satisfaction reported for spares was 8.4.
- Sixty-eight percent of the users reported receiving some level of software support from their in-house staff, with 47% of the users not having any software support contract at all.
- Forty-four percent of the users reported receiving multivendor services on other vendors' peripherals.

EXHIBIT III-B-1

Contract Coverage
IBM PS/2

	Percent of Sample 1991
Days Covered	
Monday - Friday	68
Monday - Saturday	0
Monday - Sunday	32
Hours Covered	
1 - 9	55
10 - 16	16
17 - 24	29

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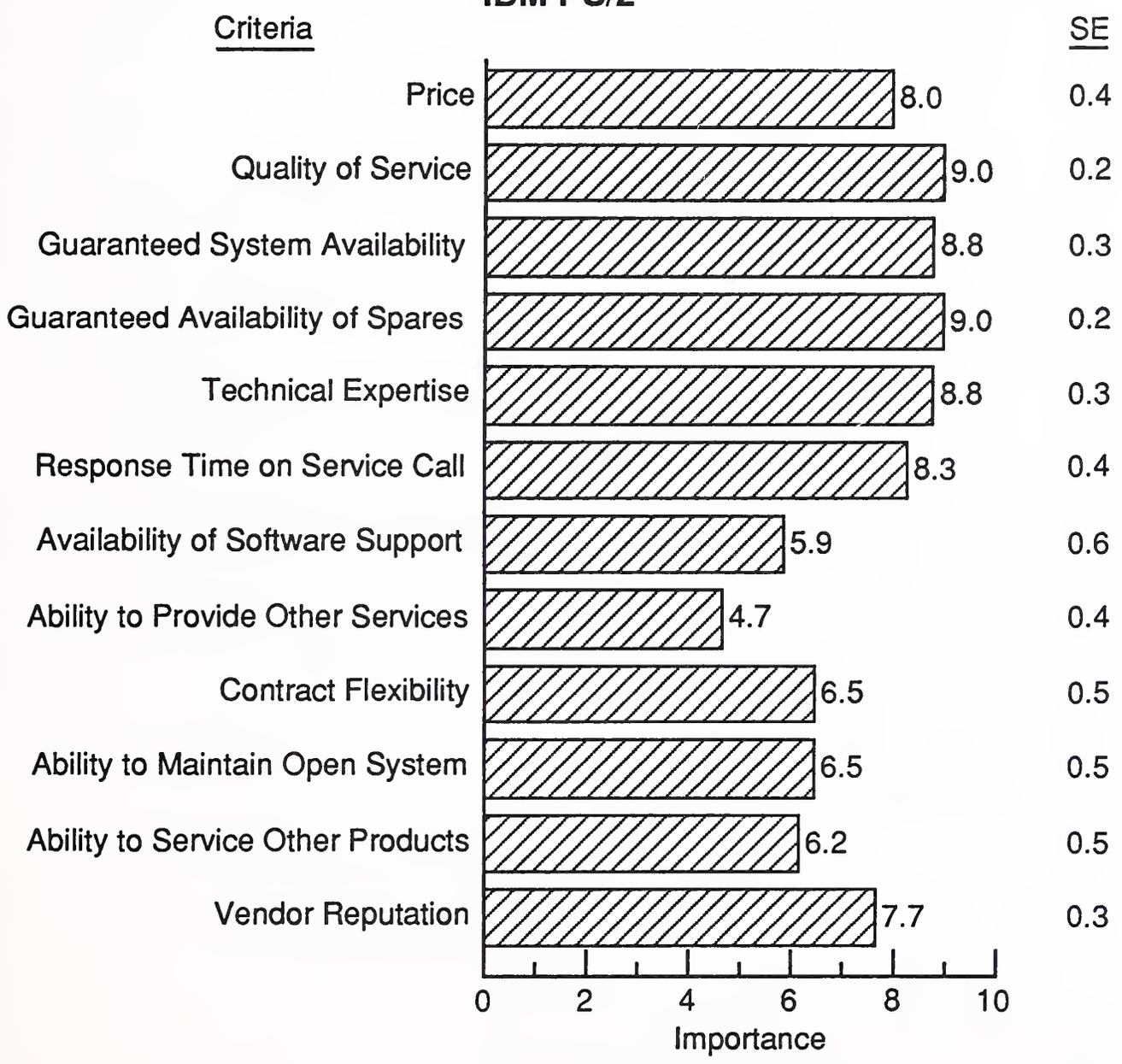
EXHIBIT III-B-2

Service Vendor Selection Criteria
IBM PS/2



SE: Standard Error of the Mean.

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EXHIBIT III-B-3

Hardware Maintenance Provider
IBM PS/2

Provider	Percent of Mentions	Primary
Manufacturer	38	31
Dealer/Distributor	16	6
Independent Maintenance Organization	53	47
In-House	31	16
Other	0	0

Multiple Responses Allowed.

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EXHIBIT III-B-4

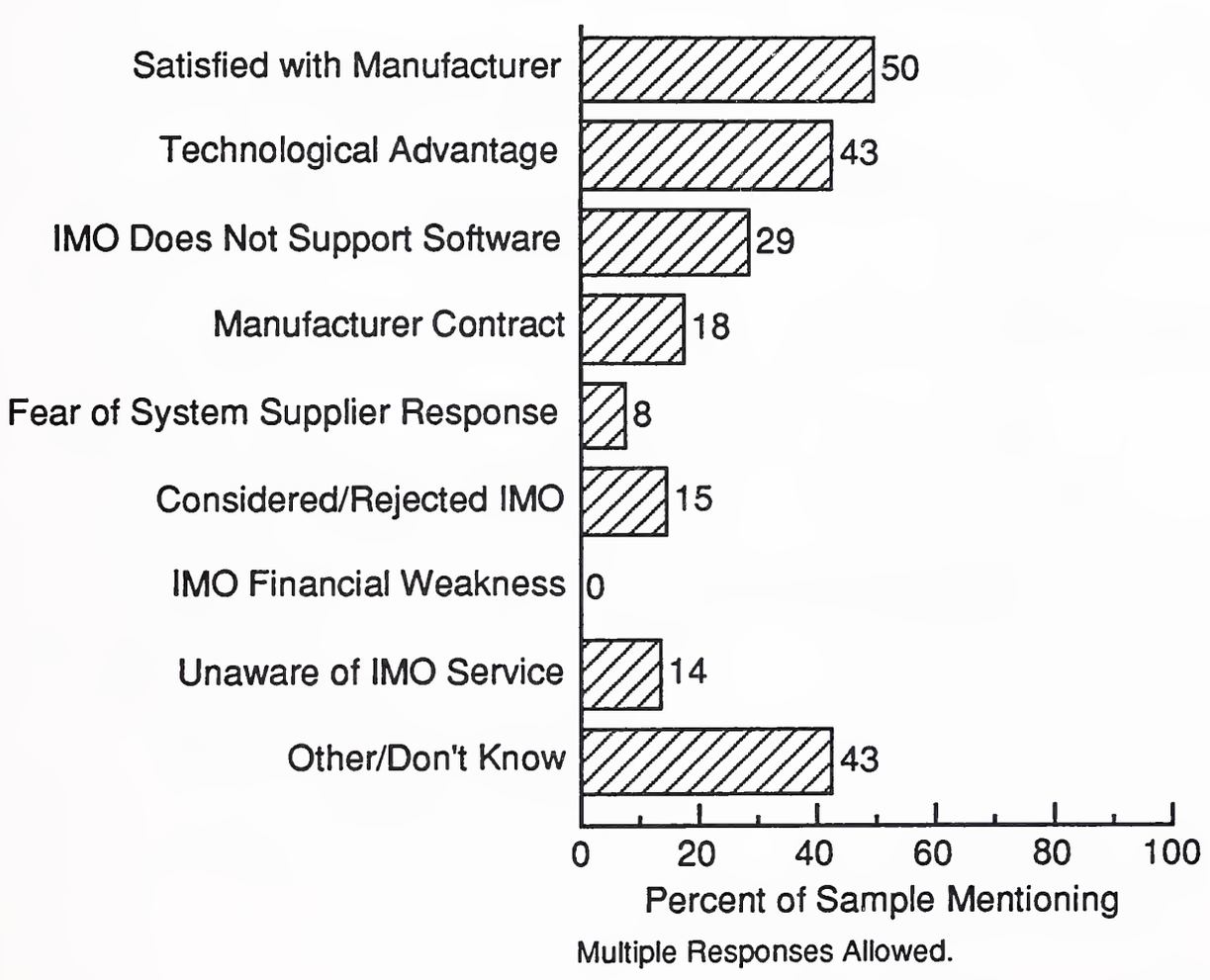

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EXHIBIT III-B-4A

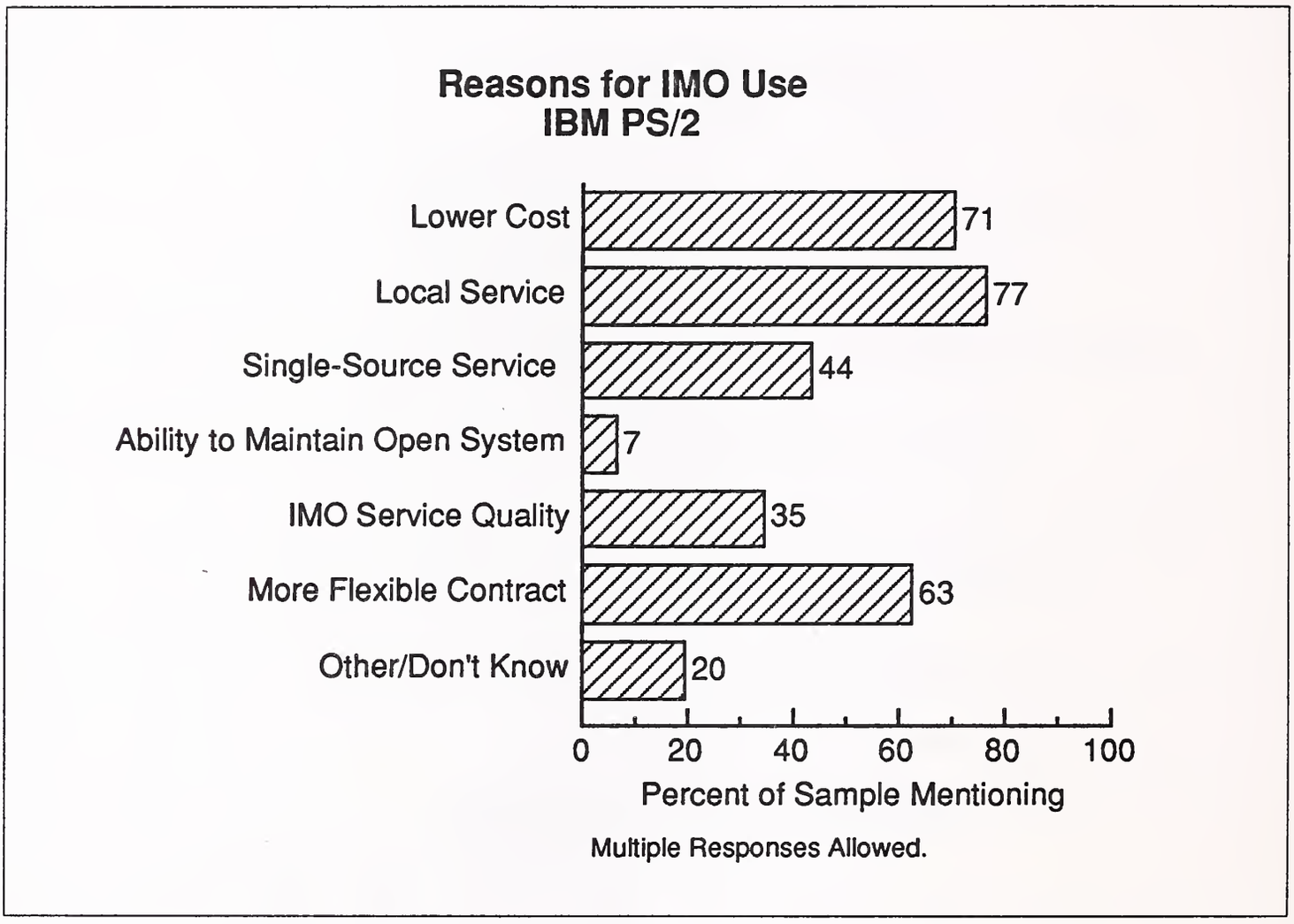

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EXHIBIT III-B-5

Maintenance Contract Terms
IBM PS/2

Hardware Maintenance	Percent of Respondents
Warranty	10
Five Years	0
Three Years	3
One Year	26
Time and Materials	45
Other	10
None	6

EXHIBIT III-B-6

System Availability Performance Analysis
IBM PS/2

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	98.1	96.8	66
Response Time (hrs.)	6.7	6.2	95
Repair Time (hrs.)	16.0	16.1	83

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EXHIBIT III-B-7

System Failure Rates
IBM PS/2

Mean Failures Per Year	0.2
Causes of Failure (%)	
Hardware	69
Systems Software	10
Applications Software	5
Other	16

Sample: 28

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EXHIBIT III-B-8

Hardware Service Required versus Received IBM PS/2

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	9.2	8.2	8.4	52
Engineer Skills	8.9	8.2	8.2	66
Documentation of Maintenance	7.1	7.4	7.8	65
Help Desk Support	7.0	7.1	7.4	74
Remote Diagnostics	5.3	6.5	7.3	56
Real-Time Software Diagnostics	6.3	6.3	6.9	62
Overall Hardware Maintenance	8.9	8.3	8.2	63

Note: Scale 1-10, 1 = Lowest, 10 = Highest

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EXHIBIT III-B-9

Software Maintenance Provider
IBM PS/2

Provider	Percent of Mentions
Hardware Manufacturer	29
Other Hardware Service Provider	3
Software Product Vendor	29
Value-Added Reseller (VAR)	10
In-House	68
Other	0

Multiple Responses Allowed.

EXHIBIT III-B-10

System Software
Maintenance Contract Terms
IBM PS/2

Software Maintenance	Percent of Respondents
Included in License Fee	13
Three-Year	3
One-Year	9
Custom	22
None	47
Don't Know	6

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EXHIBIT III-B-11

System Software Problem Resolution
IBM PS/2

Solved by Phone (%)	43
Elapsed Time (hrs.)	15.0
Other Problems	
Response Time	
• Required (mean hrs.)	5.8
• Received (mean hrs.)	10.2
• Percent Satisfied	71
Fix Time	
• Required (mean hrs.)	5.9
• Received (mean hrs.)	8.8
• Percent Satisfied	75

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EXHIBIT III-B-12

System Software Support Required versus Received IBM PS/2

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.3	8.2	7.8	67
Documentation	8.9	8.5	8.2	73
Software Installation	8.0	8.4	8.5	68
Provision of Updates	8.0	7.8	7.7	79
Operational Training	7.0	6.7	7.2	67
Software Remote Support	6.4	6.6	7.4	75
Software Support Overall	8.5	7.9	8.0	68

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest

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EXHIBIT III-B-13

Ancillary Services
IBM PS/2

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	9	6.6	7.3	78	16
Capacity Planning	11	6.3	7.0	73	14
Environmental Planning	7	4.9	6.3	67	10
Cabling	15	7.2	6.9	60	11
Software Evaluation	11	6.3	6.0	64	16
Maintenance-Related Training	12	6.3	5.8	42	12
Install/Deinstall/Move	15	7.1	6.5	67	11
Consulting	17	6.0	7.2	71	7
Network Planning	13	6.4	6.0	39	10
Network Management	12	6.2	5.5	25	11
Disaster Recovery	10	7.2	7.7	50	15
Facilities Management	6	5.2	6.2	83	7
Problem Management	7	5.9	7.0	86	10
Applications Software Support	19	7.2	7.3	42	10

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EXHIBIT III-B-14

Multivendor Services
IBM PS/2

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	28	3.2
Peripherals	44	3.4
Network Products	31	2.9
		Level of Interest
Single Point of Contact		3.2

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-B-15

Discounts
IBM PS/2

	Percent Receiving	Mean Willingness to Receive
Multiyear	20	4.3
Prepayment	12	3.0
Call Screening/Problem Management	12	2.6
Deferred Response	0	3.1

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest

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C
Sun

The sample consisted of 33 users of Sun workstations. In analyzing the data collected, the following points appear significant:

- As in other portions of the PC/workstation sample, Sun respondents value the service quality components more highly than contractual items when evaluating a service vendor.

- Fifty-eight percent of the respondents have the manufacturer as the primary provider of service on their Sun equipment, with 39 having an IMO as the primary service provider.

- Major reasons for why the manufacturer is chosen for service include satisfaction with the manufacturer and the technological advantage of the manufacturer.

- Major reasons for IMO service use include local service and lower costs for service.

- Seventy-nine percent of the users have only a one-year contract with their service providers, with 12% having time-and-materials or "other" types of contracts and 3% having no contract.

- Even though the mean system availability received is higher than the mean system availability required, only 62% of the Sun respondent group, on an individual basis, received system availability equal to or better than their requirement.

- Overall, hardware maintenance had the lowest percent (58%) of users receiving the required level of service or better, compared to the individual components of hardware maintenance.

- Fifty-seven percent of the Sun group reported receiving a discount off their service pricing for prepayment of their service contract. A very high mean rating of willingness to receive (4.9) indicates a high level of interest in prepayment discounts for those not presently receiving them.

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EXHIBIT III-C-1

Contract Coverage
Sun

	Percent of Sample	
	1991	1990
Days Covered		
Monday - Friday	90	77
Monday - Saturday	7	0
Monday - Sunday	3	23
Hours Covered		
1 - 9	84	64
10 - 16	3	0
17 - 24	13	36

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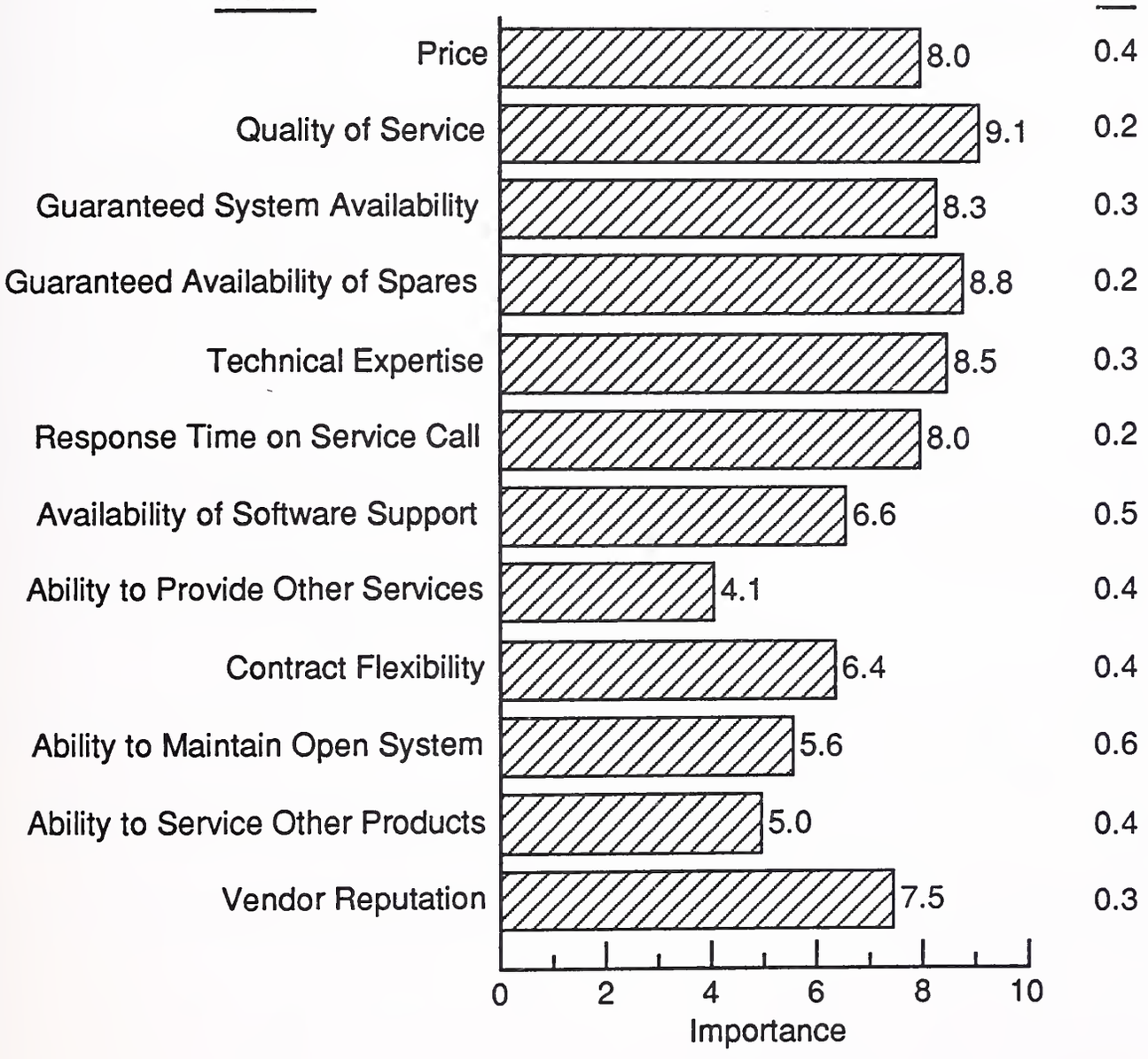
EXHIBIT III-C-2

Service Vendor Selection Criteria
Sun



SE: Standard Error of the Mean.

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EXHIBIT III-C-3

Hardware Maintenance Provider
Sun

Provider	Percent of Mentions	Primary
Manufacturer	67	58
Dealer/Distributor	0	0
Independent Maintenance Organization	42	39
In-House	9	3
Other	0	0

Multiple Responses Allowed.

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EXHIBIT III-C-4

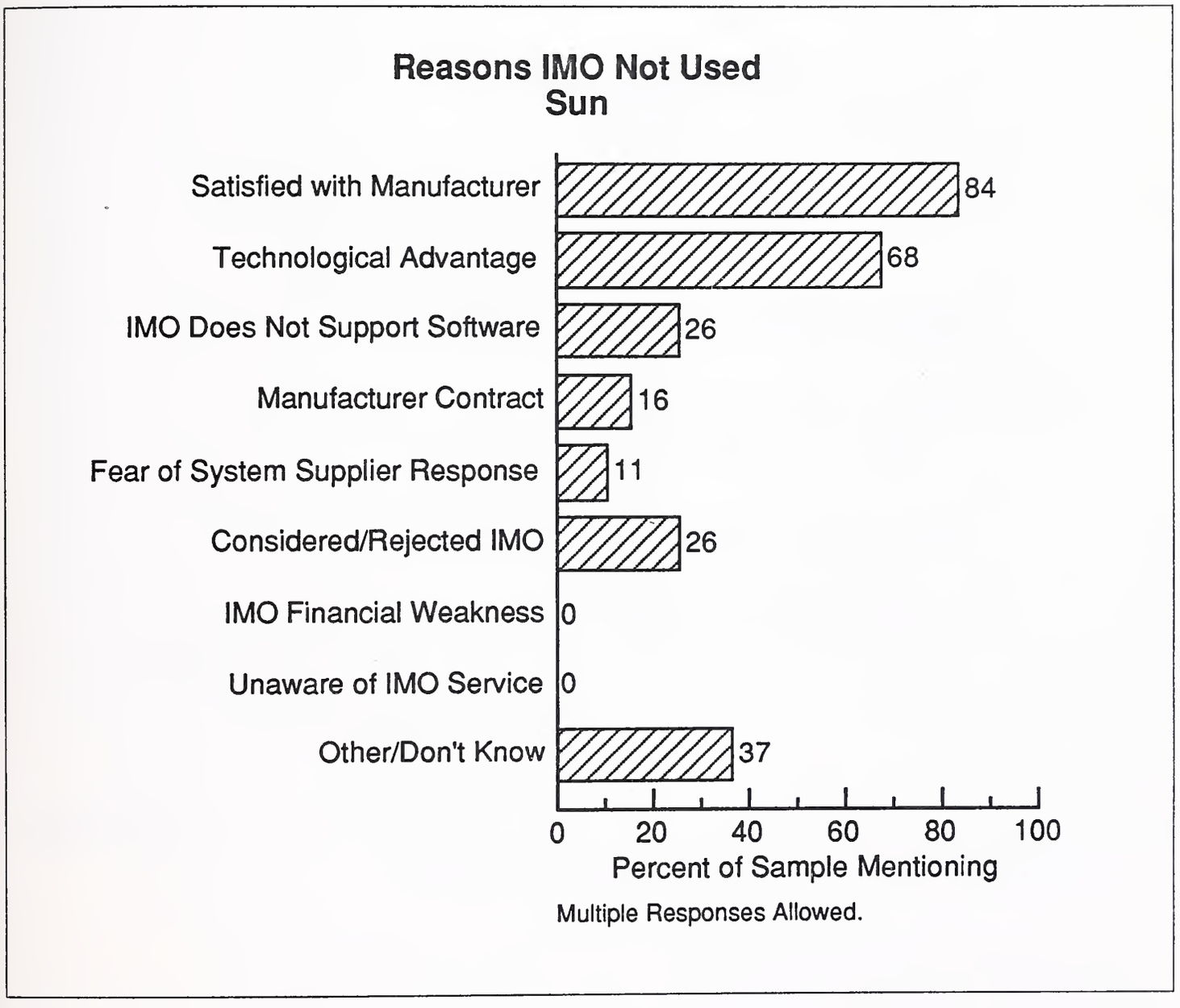

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EXHIBIT III-C-4A

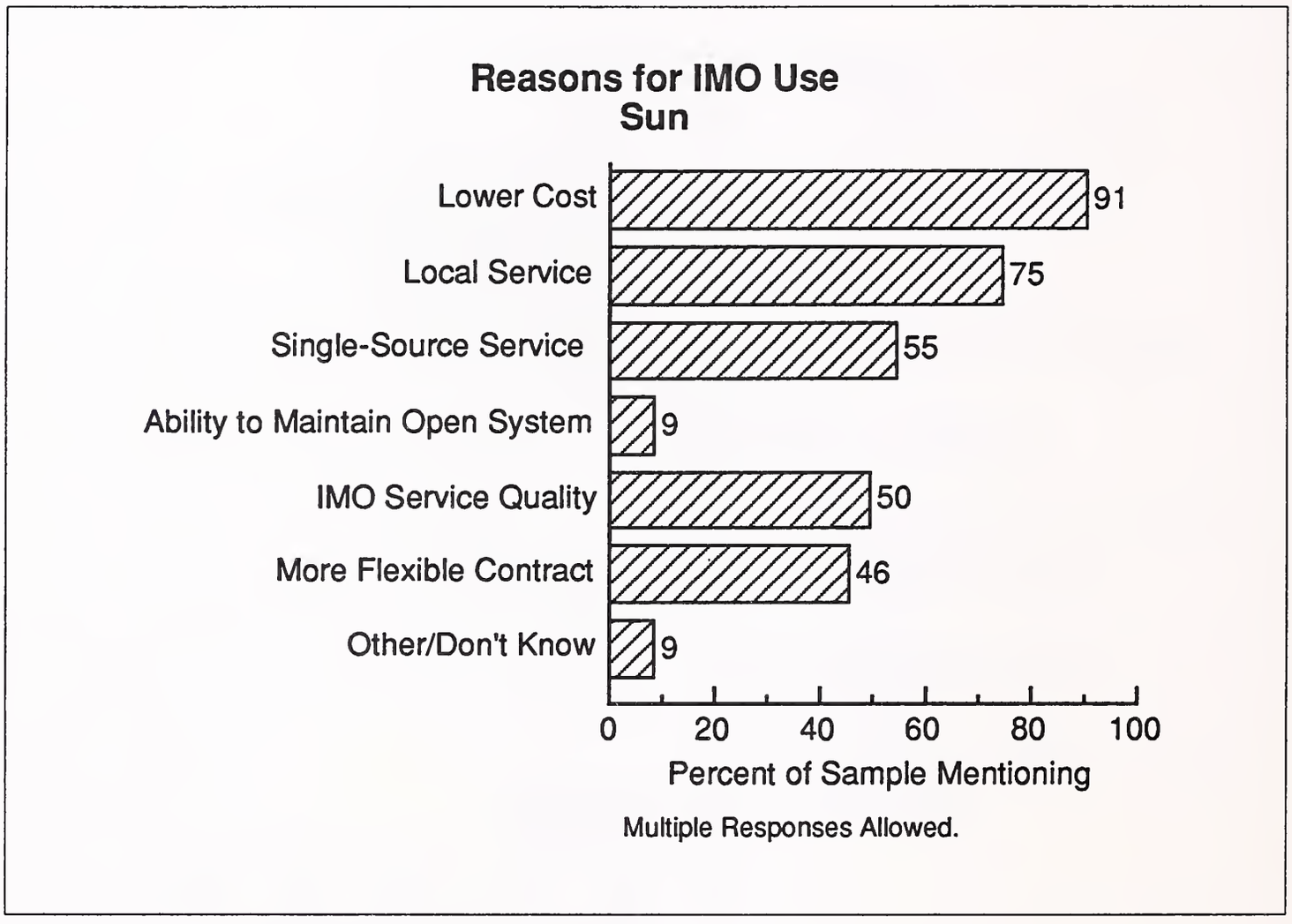

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EXHIBIT III-C-5

Maintenance Contract Terms
Sun

Hardware Maintenance	Percent of Respondents
Warranty	0
Five Years	3
Three Years	3
One Year	79
Time and Materials	6
Other	6
None	3

EXHIBIT III-C-6

System Availability Performance Analysis
Sun

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	96.8	97.1	62
Response Time (hrs.)	9.3	8.0	95
Repair Time (hrs.)	13.0	13.2	86

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EXHIBIT III-C-7

System Failure Rates
Sun

Mean Failures Per Year	0.6
Causes of Failure (%)	
Hardware	77
Systems Software	7
Applications Software	4
Other	12

Sample: 31

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EXHIBIT III-C-8

Hardware Service Required versus Received
Sun

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	8.7	8.1	8.4	68
Engineer Skills	8.1	7.1	7.6	65
Documentation of Maintenance	7.0	5.7	6.1	62
Help Desk Support	7.5	6.7	7.0	69
Remote Diagnostics	4.5	4.2	5.6	80
Real-Time Software Diagnostics	5.2	5.9	6.5	83
Overall Hardware Maintenance	8.4	7.8	8.1	58

Note: Scale 1 -10, 1 = Lowest, 10 = Highest

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EXHIBIT III-C-9

Software Maintenance Provider
Sun

Provider	Percent of Mentions
Hardware Manufacturer	64
Other Hardware Service Provider	3
Software Product Vendor	3
Value-Added Reseller (VAR)	6
In-House	73
Other	0

Multiple Responses Allowed.

EXHIBIT III-C-10

System Software
Maintenance Contract Terms
Sun

Software Maintenance	Percent of Respondents
Included in License Fee	6
Three-Year	3
One-Year	46
Custom	9
None	27
Don't Know	9

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EXHIBIT III-C-11

System Software Problem Resolution
Sun

Solved by Phone (%)	53
Elapsed Time (hrs.)	13.2
Other Problems	
Response Time	
• Required (mean hrs.)	7.5
• Received (mean hrs.)	4.9
• Percent Satisfied	90
Fix Time	
• Required (mean hrs.)	6.8
• Received (mean hrs.)	5.1
• Percent Satisfied	50

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EXHIBIT III-C-12

System Software Support Required versus Received Sun

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.7	7.9	7.9	57
Documentation	8.4	7.6	7.8	88
Software Installation	7.6	7.4	7.9	69
Provision of Updates	8.6	8.0	8.0	80
Operational Training	5.4	5.7	6.1	72
Software Remote Support	4.6	6.0	6.4	69
Software Support Overall	7.9	7.4	7.7	65

Note: Scale 1 -10, 1 = Lowest, 10 = Highest

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EXHIBIT III-C-13

Ancillary Services
Sun

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	20	5.8	6.6	80	8
Capacity Planning	16	5.7	5.9	75	10
Environmental Planning	12	4.0	4.7	67	13
Cabling	14	5.8	6.2	71	11
Software Evaluation	15	5.9	5.7	60	12
Maintenance-Related Training	9	4.1	5.4	56	11
Install/Deinstall/Move	17	5.6	6.9	82	8
Consulting	17	4.5	5.5	71	7
Network Planning	16	6.7	6.1	63	10
Network Management	13	6.2	6.0	54	12
Disaster Recovery	10	6.0	6.1	70	14
Facilities Management	9	4.5	4.8	67	14
Problem Management	16	5.2	5.2	63	9
Applications Software Support	24	6.6	6.8	63	6

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EXHIBIT III-C-14

Multivendor Services
Sun

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	15	2.2
Peripherals	21	2.5
Network Products	18	2.5

	Level of Interest
Single Point of Contact	3.4

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-C-15

Discounts
Sun

	Percent Receiving	Mean Willingness to Receive
Multiyear	23	3.6
Prepayment	57	4.9
Call Screening/Problem Management	10	4.0
Deferred Response	13	3.5

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest

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Summary Charts

Summary Charts

In this chapter, INPUT presents a summary of selected data from the 1991 PC/workstation user requirements study. These summary charts allow a vendor-by-vendor comparison of service performance. Data is presented on factors that can be compared on an absolute basis.

The key to an analysis of customer satisfaction is the ability of the vendor to meet or exceed the expectations of the customer. Even the highest rating is lacking if the user's requirement exceeds the rating.

In these charts, the following definitions apply:

- Difference is a comparison of the mean service required to the mean service received. A negative number denotes a shortfall in the service received. A positive number denotes that the mean service received exceeded the mean service required.

- Percent satisfied is based on whether the service received met or exceeded service required for each individual respondent. A count is made of how many individuals had their requirements met or exceeded for that particular service requirement, which converts to the percent satisfied.

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EXHIBIT IV-1

PC/Workstation Systems Vendor Performance System Interruptions

Vendor	Mean Number Per Year	Percent Caused By:			
		Hardware	System Software	Applications Software	Other
Apollo Workstations	1.0	81	11	2	6
IBM PS/2	0.2	69	10	5	16
Sun Workstations	0.6	77	7	4	12
All Vendors	0.6	77	10	3	10

EXHIBIT IV-2

PC/Workstation Systems Vendor Performance System Availability

Vendor	System Availability (Percent)		
	Required	Received	Difference
Apollo Workstations	95.5	95.4	-0.1
IBM PS/2	98.1	96.8	-1.3
Sun Workstations	96.8	97.1	0.3
All Vendors	96.8	96.4	-0.4

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EXHIBIT IV-3

PC/Workstation Systems Vendor Performance Response Time

Vendor	Response Time (Hours)		
	Required	Received	Difference
Apollo Workstations	10.7	10.4	0.3
IBM PS/2	6.7	6.2	0.5
Sun Workstations	9.3	8.0	1.3
All Vendors	8.9	8.5	0.4

EXHIBIT IV-4

PC/Workstation Systems Vendor Performance Repair Time

Vendor	Repair Time (Hours)		
	Required	Received	Difference
Apollo Workstations	8.0	9.8	-1.8
IBM PS/2	16.0	16.1	-0.1
Sun Workstations	13.0	13.2	-0.2
All Vendors	12.5	12.5	0.0

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EXHIBIT IV-5

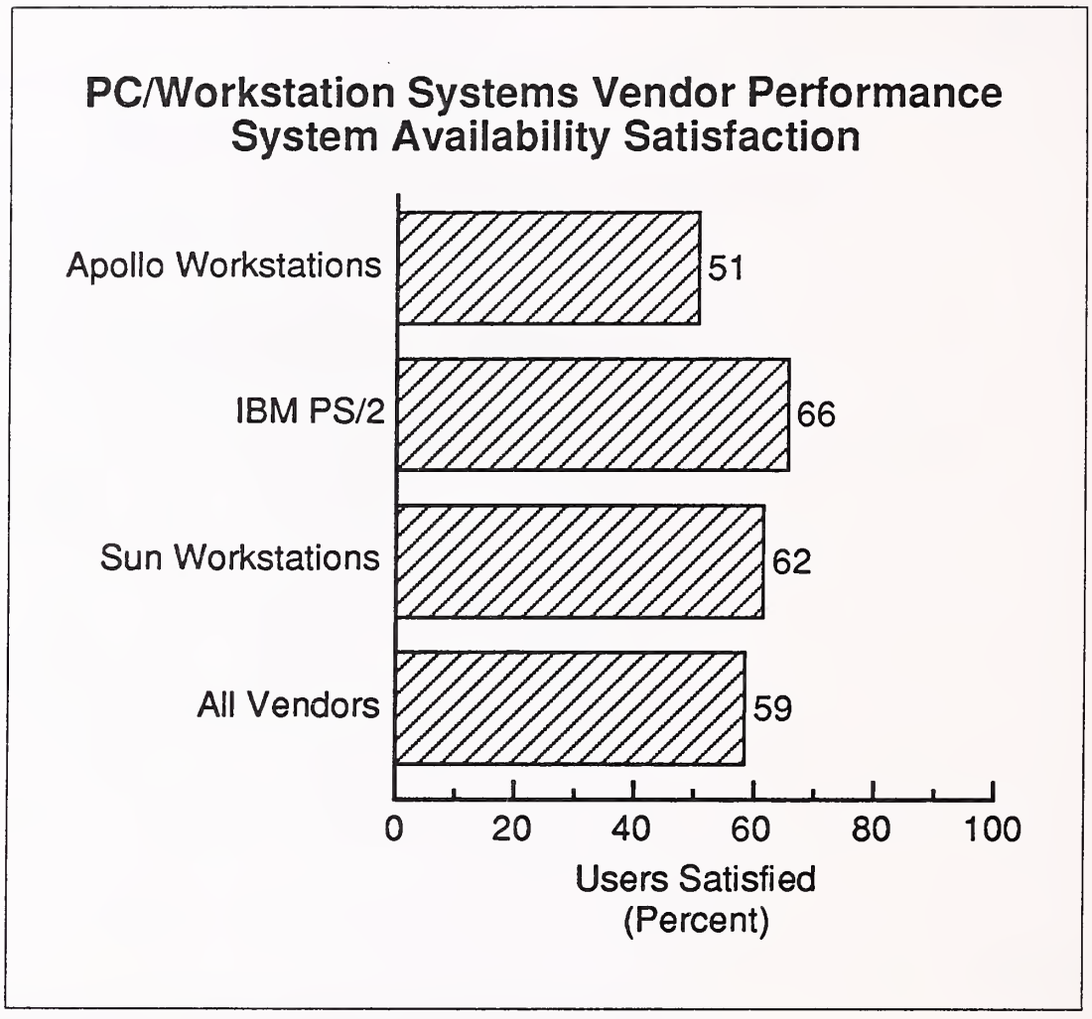

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EXHIBIT IV-6

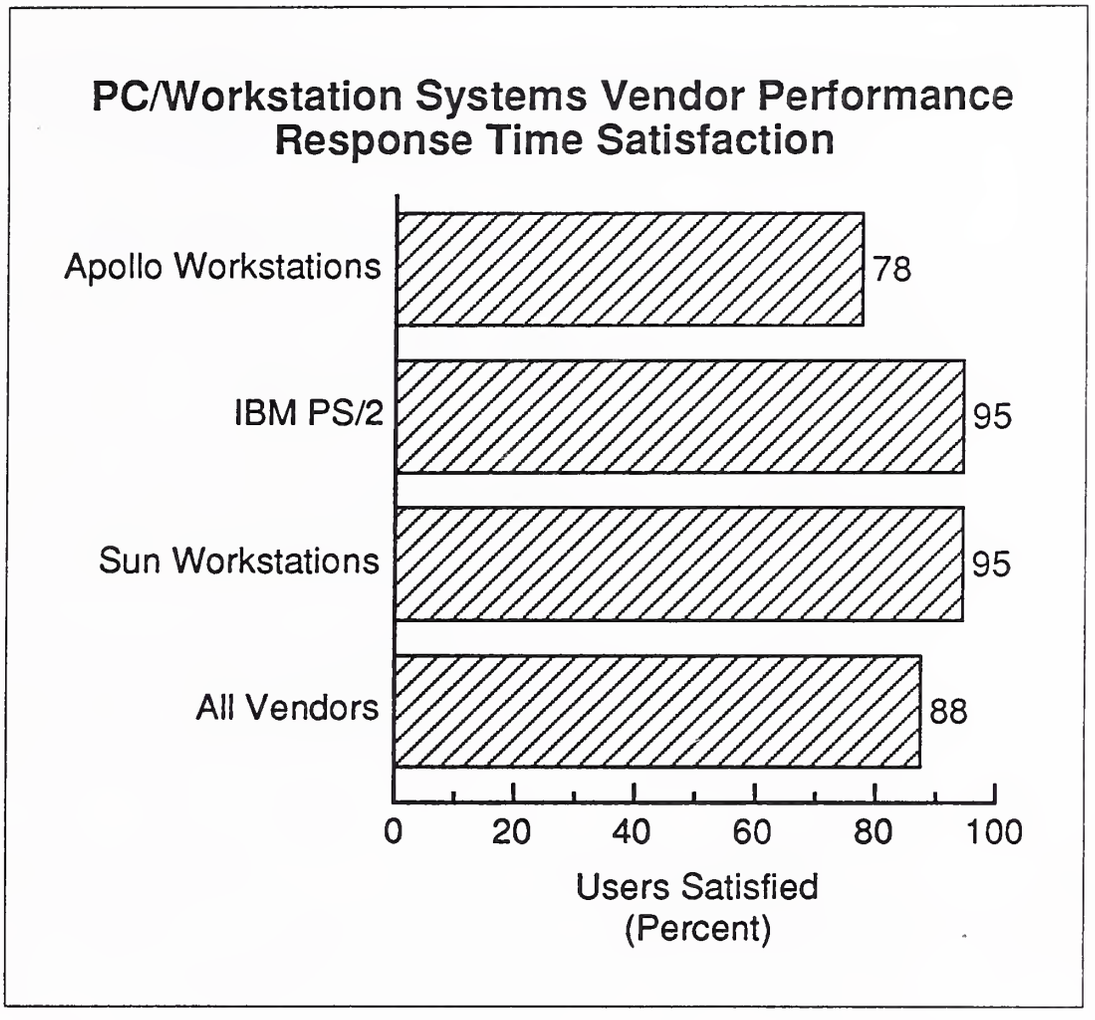

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EXHIBIT IV-7

PC/Workstation Systems Vendor Performance Repair Time Satisfaction

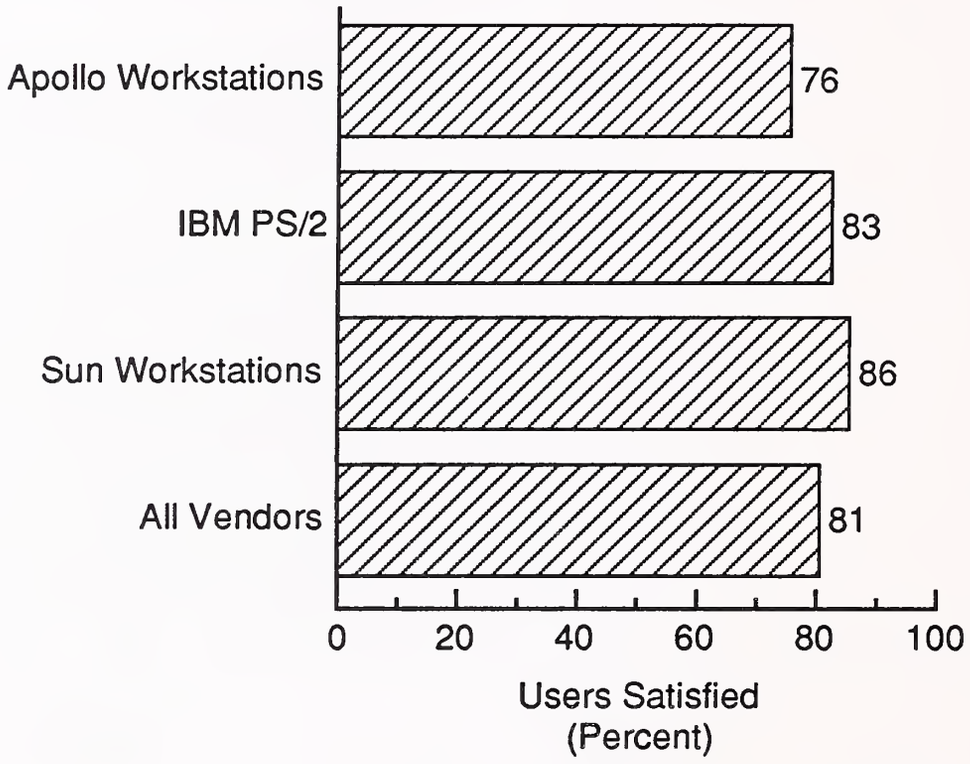

EXHIBIT IV-8

PC/Workstation Systems Vendor Performance Hardware Maintenance Required versus Received

Vendor	Mean Required	Mean Received	Mean Satisfaction
Apollo Workstations	8.9	8.2	8.2
IBM PS/2	8.9	8.3	8.2
Sun Workstations	8.4	7.8	8.1
All Vendors	8.8	8.1	8.2

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EXHIBIT IV-9

PC/Workstation Systems Vendor Performance
Hardware Maintenance Satisfaction

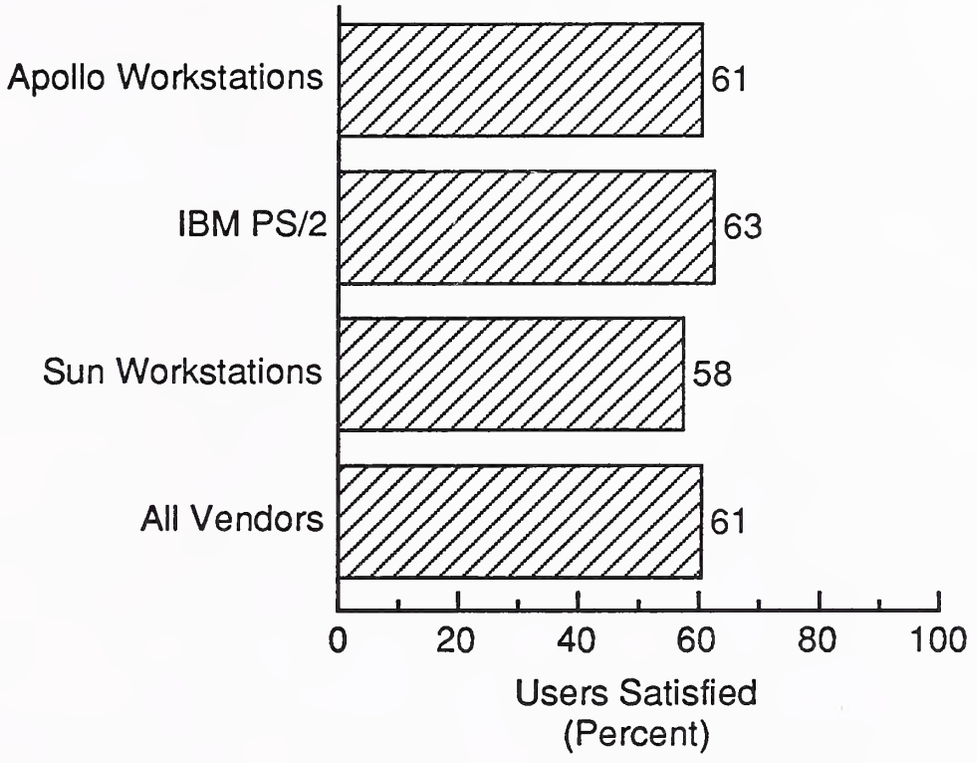

EXHIBIT IV-10

PC/Workstation Systems Vendor Performance
Software Support
Required versus Received

Vendor	Mean Required	Mean Received	Mean Satisfaction
Apollo Workstations	8.6	7.5	7.8
IBM PS/2	8.5	7.9	8.0
Sun Workstations	7.9	7.4	7.7
All Vendors	8.3	7.6	7.8

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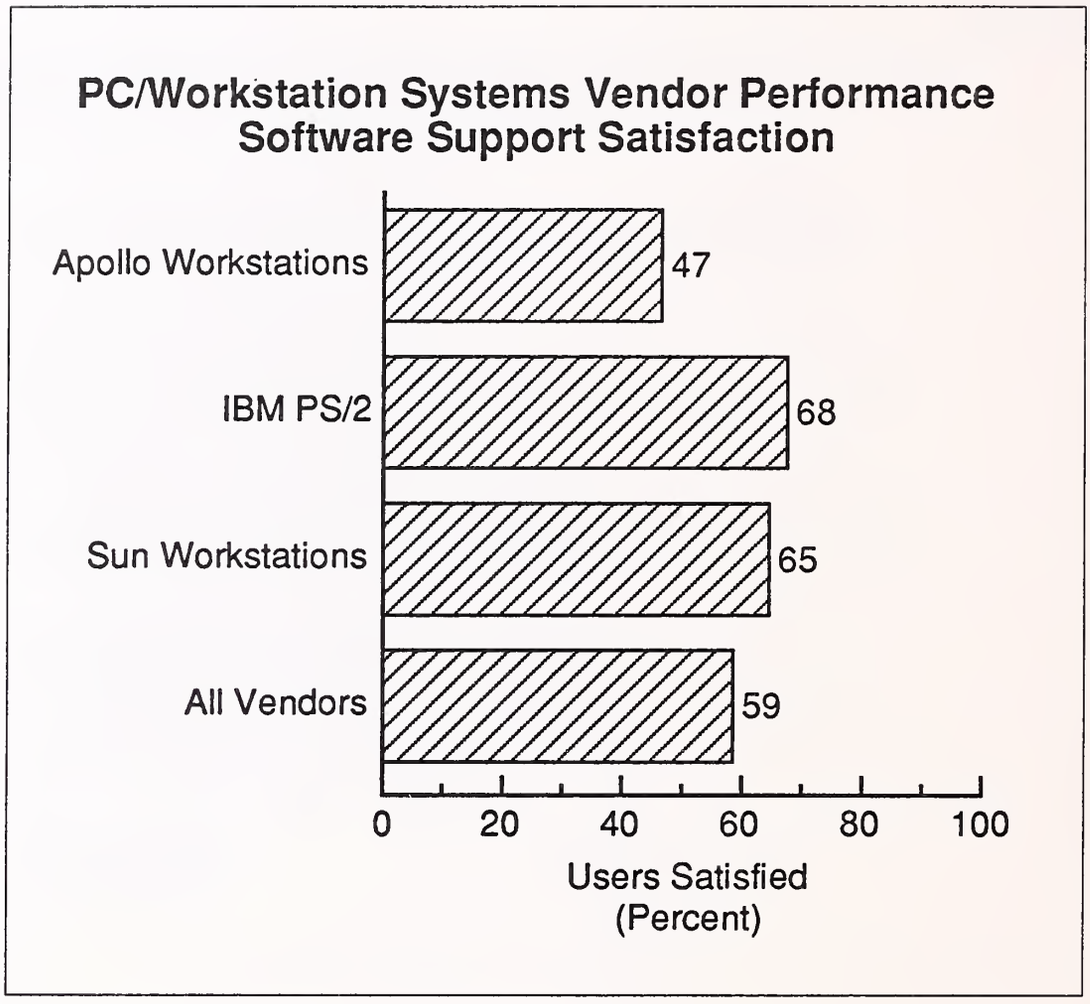
EXHIBIT IV-11



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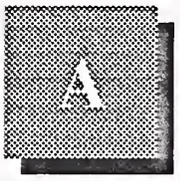
Appendix



Appendix: Questionnaire

A. GENERAL

1. What is the make and model of the main computer on your site and how many units do you have?

- Make _____
- Model _____
- Units _____

2. Are you the person responsible for this system?

If not, then who would be the correct person?

Name of person responsible _____

Phone Number _____

3. Do you have another system? What is the make and model number of that system, and how many units do you have?

- Make _____
- Model _____
- Units _____

All of the following questions that I am going to ask you are related to your _____ system.

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4. Could you please rate the importance of the following criteria in selecting your service vendor, on a scale of 1 to 10 (1=Low, 10=High)?

Criteria	Rating
a) Price	_____
b) Quality of service	_____
c) Guaranteed system availability level	_____
d) Guaranteed availability of spare parts	_____
e) Technical expertise	_____
f) Response time on a service call	_____
g) Availability of software support	_____
h) Ability to provide other services	_____
i) Contract flexibility	_____
j) Ability to maintain open systems	_____
k) Ability to service other products	_____
l) Vendor reputation	_____

B. SERVICE VENDOR SELECTION

I would like to ask you some questions about the basic hardware maintenance of your computer system.

5. Would you please tell me who services your system hardware?
Who is the primary service vendor? (check one)

(Please circle appropriate service provider type; multiple answers are allowed.)

		Primary
• Manufacturer	Y/N	_____
• Dealer/distributor	Y/N	_____
• Independent maintenance company	Y/N	_____
• Own company	Y/N	_____
• Other _____	Y/N	_____

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If the respondent answered YES to independent maintenance, continue with question 6A. If not, go to question 6B.

6A. Your system, or part of it, is serviced by an independent maintenance company. Could you tell me the reason why you use independent maintenance?

(Please circle appropriate answer; multiple answers are allowed.)

- Lower cost Y/N
- Local service Y/N
- Single-source service Y/N
- Better able to maintain open systems Y/N
- TPM service is higher quality Y/N
- More flexible contract Y/N
- Other Y/N
- Do not know Y/N

(Go to question 7)

6B. You do not use an independent maintenance company. What is the reason for this?

(Please circle appropriate answer; multiple answers are allowed.)

- Satisfied with manufacturer Y/N
- Manufacturer has a technological advantage Y/N
- IMO cannot support software Y/N
- Tied to manufacturer with long-term contract Y/N
- Fear of system supplier response Y/N
- Considered and rejected IMO Y/N
- IMO financial weakness Y/N
- Unaware of IMO service Y/N
- Other Y/N
- Do not know Y/N

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7. What maintenance coverage do you receive on this CPU:

   a. How many days per week? _____

   b. How many hours per day? _____

   c. Which type of hardware maintenance contract do you currently have on the main part of your system?

   (Please circle appropriate answer; only ONE answer allowed.)

   - Warranty 1
   - Five years 2
   - Three years 3
   - One year 4
   - Time and Materials 5
   - Other _____ 6
   - None 7

8. Over the last 12 months, how many system interruptions (system failures) did you have per month? _____ or per year? _____

   And what percentage of these system failures were due to:

   Hardware _____%

   Systems software _____%

   Applications software _____%

   Other (i.e., power failure) _____%

   (Please check that percentages add up to 100%)

9. If we define SYSTEMS AVAILABILITY as the percentage of your normal working hours that the system is operational (disregarding non-critical peripheral outages), what percentage availability do you require? What is the percentage actually received over the last twelve months for that system?

   - Required _____%
   - Received _____%

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10. Defining HARDWARE RESPONSE TIME as the time it takes between reporting a fault and the arrival of the service engineer on site, in working hours, what response time (in hours) do you require, and what did you actually experience as an average over the last twelve months?

- Require_____Hours
- Experienced _____Hours

11. If REPAIR TIME is defined as the time taken to get the system fully operational from the time the engineer arrives on site, what time do you require (in working hours) and what time did you experience during the last twelve months?

- Require_____Hours
- Experienced _____Hours

12. I would now like to go through a list of seven aspects of hardware maintenance and ask you to give each a rating on a scale of 1-10 for the service level you require, the service level you receive, and your satisfaction with that service.

	Required	Received	Satisfaction
• Spares Availability	_____	_____	_____
• Engineer Skills	_____	_____	_____
• Documentation of Maintenance	_____	_____	_____
• Help Desk Support	_____	_____	_____
• Remote Diagnostics	_____	_____	_____
• Real-time Software Diagnostics	_____	_____	_____
• Overall Hardware Maintenance	_____	_____	_____

13. If possible, I would like you to provide some information on hardware maintenance pricing.

a) What percentage price increase or decrease did you pay for hardware maintenance in the year 1990?

- Increase _____%
- Decrease _____%
- No Change Y/N (Circle)

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b) What do you expect the price changes for hardware maintenance to be in the future, in percentage terms per year?

- Increase _____%
- Decrease _____%
- No Change Y/N (Circle)

C. SOFTWARE SUPPORT

I would like to ask you some questions now regarding the software service that you receive. These questions relate to system software only—NOT APPLICATIONS SOFTWARE.

14A. Who supports your systems software?

(Please circle appropriate answer; multiple answers allowed.)

- Hardware Manufacturer Y/N
- Other Hardware Service Provider Y/N

  (Specify _____)
- Software Product Vendor Y/N
- Value-Added Reseller (VAR) Y/N
- In-house Y/N
- Other (Specify _____) Y/N
- Do not know Y/N

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14B. What type of systems software support contract do you currently have?

(Please circle appropriate answer. Only ONE answer allowed.)

- Support included in software license fee 1
- Three-year contract 2
- One-year contract 3
- Ad hoc/custom 4
- None 5
- Do not know 9

15. What percentage of systems software problems are solved by telephone, and, on average, how long does this take in elapsed time?

- Solved by Phone _____%
- Elapsed Time _____Hours

16. For those problems that are NOT possible to solve over the telephone, what RESPONSE TIME would you find acceptable, and what time (on average and in working hours) have you experienced over the last twelve months? (Take RESPONSE TIME to mean from the time the problem is reported to the arrival of the engineer on site.)

- Acceptable _____Hours
- Experienced _____Hours

17. If FIX TIME is defined as the time taken to get the system software fully operational from the arrival of the engineer on site, then what time (in working hours) do you find acceptable, and what did you experience over the last twelve months?

- Acceptable _____Hours
- Experienced _____Hours

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18. I would like to go through a list of aspects of SYSTEMS SOFTWARE SUPPORT and ask you to give an IMPORTANCE or REQUIRED rating of the aspect, a RECEIVED rating, and a SATISFACTION with service received rating for each. (Scale 1-10)

	Importance/ Required	Received	Satisfaction
• Software Engineer Skills Level	_____	_____	_____
• Software Documentation	_____	_____	_____
• Software Installation	_____	_____	_____
• Provision of Updates	_____	_____	_____
• Operational Training	_____	_____	_____
• Software Remote Support	_____	_____	_____
• Software Support Overall	_____	_____	_____

19. If possible, I would like you to provide some information on systems software support pricing.

a) What percentage price increase or decrease did you pay for systems software support in the year 1990?

- Increase _____%
- Decrease _____%
- No Change Y/N (Circle)

b) What do you expect the changes for systems software support to be in the future, in percentage terms per year?

- Increase _____%
- Decrease _____%
- No Change Y/N (Circle)

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D. ANCILLARY SERVICES

I would like to discuss with you now services beyond normal maintenance. I am particularly interested in obtaining your views on other services or modified current service offerings that your service suppliers could provide that would help to improve the running of your computer systems.

20. On a scale of 1-10, could you rate your requirement for these services and what you are now receiving. (Scale 1-10; not required/receiving = 0)

	(a) Require (1-10)	(b) Received (1-10)
• Configuration Planning	_____	_____
• Capacity Planning	_____	_____
• Environmental Planning	_____	_____
• Cabling	_____	_____
• Software Evaluation	_____	_____
• Maintenance-Related Training	_____	_____
• Installation/Deinstallation/Moves	_____	_____
• Consulting	_____	_____
• Network Planning	_____	_____
• Network Management	_____	_____
• Disaster Recovery	_____	_____
• Facilities Management	_____	_____
• Problem Management	_____	_____
• Applications Software Support	_____	_____

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21. How important is it that your service vendor communicates with you regularly and effectively to advise you of, for example:

- The status of your system
- Possible problems
- Repair plans
- Availability of spare parts
- Routine visits
- Hardware and software changes

Could you please rate your requirement for this communication on a scale of 1 to 10 where 1 indicates a low requirement or communication received and 10 is a high requirement or communication received.

- Required _____
- Received _____

22a. Do you currently receive any of the following multivendor services from your service provider? (Circle)

a. Service on other manufacturers' CPUs? Y/N
b. Service on other manufacturers' peripherals? Y/N
c. Service on other manufacturers' network products? Y/N

22b. Please rate on a scale of 1-5 how important these services would be in the next three years for you. (1 = no interest and 5 = high interest)

(1-5)

a. Service on other manufacturers' CPUs? _____
b. Service on other manufacturers' peripherals? _____
c. Service on other manufacturers' network products? _____

22c. On a scale of 1-5, what would be your level of interest in a single-point-of-contact service arrangement?

(1 = no interest, 5 = high interest) _____

23a. Do you currently receive any of the following discounts off your service pricing?

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23b. For those not receiving, what is your level of interest in these discounts?

	(a) Y/N	(b) LOI (1-10)
Multi-year	_____	_____
Prepayment	_____	_____
Call Screening/ Problem Management	_____	_____
Deferred Response	_____	_____
Other	_____	_____

24. To wrap this up, may I ask what you would consider to be your single most pressing service concern at this time?

_____

_____

_____

_____

25. And, if you could choose one additional service that your vendor is not currently providing, what would that be?

_____

_____

_____

_____

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This completes the questionnaire. I would like to thank you on behalf of INPUT for helping us to complete this survey. To express our appreciation for your time, we will be sending you a "Thank You" package containing a summary of the results from our survey. To make sure you receive your complimentary report summary, let me check the spelling of your name and the address information. (Confirm and record on cover sheet.)

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Report Quality Evaluation

To our clients:
To ensure that the highest standards of report quality are maintained, INPUT would appreciate your assessment of this report. Please take a moment to provide your evaluation of the usefulness and quality of this study. When complete, simply fold, staple, and drop in the mail. Postage has been pre-paid by INPUT if mailed in the U.S.

Thank You.

1. Report title: ***U.S. PC/Workstation Systems User Requirements, 1991*** (FCNEW-3)

2. Please indicate your reason for reading this report:
   - ☐ Required reading
   - ☐ Area of high interest
   - ☐ Area of general interest
   - ☐ New product development
   - ☐ Business/market planning
   - ☐ Product planning
   - ☐ Future purchase decision
   - ☐ Systems planning
   - ☐ Other _____

3. Please indicate extent report used and overall usefulness:

	Extent		Usefulness (1=Low, 5=High)				
	Read	Skimmed	1	2	3	4	5
Executive Overview	☐	☐	☐	☐	☐	☐	☐
Complete report	☐	☐	☐	☐	☐	☐	☐
Part of report (_____ %)	☐	☐	☐	☐	☐	☐	☐

4. How useful were:

	1	2	3	4	5
Data presented	☐	☐	☐	☐	☐
Analyses	☐	☐	☐	☐	☐
Recommendations	☐	☐	☐	☐	☐

5. How useful was the report in these areas:

	1	2	3	4	5
Alert you to new opportunities or approaches	☐	☐	☐	☐	☐
Cover new areas not covered elsewhere	☐	☐	☐	☐	☐
Confirm existing ideas	☐	☐	☐	☐	☐
Meet expectations	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

6. Which topics in the report were the most useful? Why?_____

_____

7. In what ways could the report have been improved? _____

_____

8. Other comments or suggestions: _____

_____

Name _____ Title _____

Department _____

Company _____

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City _____ State _____ ZIP _____

Telephone _____ Date completed _____

Thank you for your time and cooperation.

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